DEC 1 1 1985 594C-37 FEMA 1.209:410059/986/v 1
COMPLETED
97

FLOOD INSURANCE STUDY

ORIGINAL

DOUGLAS COUNTY, OREGON
UNINCORPORATED AREAS

VOLUME 1 OF 2

REVISED: MARCH 4, 1986

Federal Emergency Management Agency

COMMUNITY NUMBER - 410059

1134

TABLE OF CONTENTS

TABLE OF CONTENTS - VOLUME 1

		Page
1.0	INTRODUCTION	1
1.1	Purpose of Study	1
1.2	Authority and Acknowledgments	1
1.3	Coordination	1
2.0	AREA STUDIED	2
2.1	Scope of Study	2
2.2	Community Description	4
2.3	Principal Flood Problems	5
2.4	Flood Protection Measures	6
3.0	ENGINEERING METHODS	6
3.1	Hydrologic Analyses	7
3.2	Hydraulic Analyses	7
4.0	FLOOD PLAIN MANAGEMENT APPLICATIONS	10
4.1	Flood Boundaries	10
4.2	Floodways	11
5.0	INSURANCE APPLICATION	49
5.1	Reach Determinations	49
5.2	Flood Hazard Factors	49
5.3	Flood Insurance Zones	49
5.4	Flood Insurance Rate Map Description	52
6.0	OTHER STUDIES	52
7.0	LOCATION OF DATA	53
8.0	BIBLIOGRAPHY AND REFERENCES	53

BEST COPY AVAILABLE

TABLE OF CONTENTS - VOLUME 1 (Cont'd)

Page

FIGURES

Figure 1 - Vicinity Map..... 3
Figure 2 - Floodway Schematic..... 48

TABLES

Table 1 - Summary of Discharges..... 8
Table 2 - Floodway Data..... 12
Table 3 - Flood Insurance Zone Data..... 50

TABLE OF CONTENTS - VOLUME 2

EXHIBITS

Exhibit 1 - Flood Profiles

Umpqua River	Panels 01P-28P
Smith River	Panels 29P-33P
Scholfield Creek	Panels 34P-35P
North Umpqua River	Panels 36P-45P
South Umpqua River	Panels 46P-57P
Deer Creek	Panels 58P-65P
South Myrtle Creek	Panel 66P
North Myrtle Creek	Panel 67P
Lower Cow Creek	Panels 68P-69P
Cow Creek	Panels 70P-82P

Exhibit 2 - Flood Boundary and Floodway Map Index
Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

BEST COPY AVAILABLE

FLOOD INSURANCE STUDY

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study has been prepared to revise and update a previous Flood Insurance Study/Flood Insurance Rate Map for the unincorporated areas of Douglas County, Oregon. This information will be used by Douglas County to update existing flood plain regulations as part of the regular program of flood insurance by the Federal Emergency Management Agency (FEMA). The information will also be used by local and regional planners to further promote sound land use and flood plain development.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Geological Survey (USGS), for FEMA, under Inter-Agency Agreement No. IAA-H-17-75, Project Order No. 7. This study was completed in February 1977.

A revised hydraulic analysis was performed for the Umpqua River from the Pacific Ocean to U.S. Highway 101. This work was completed in October 1984.

1.3 Coordination

Streams requiring detailed study were selected at a meeting attended by representatives of FEMA, the USGS, and officials of Douglas County on March 20, 1975.

During the course of the work performed by the USGS, specific information concerning this study was obtained from the U.S. Army Corps of Engineers (COE).

The final coordination meetings were held in Roseburg and Reedsport on March 15 and 16, 1977. Personnel of the Douglas County Planning Department, Douglas County Water Resources Survey, the USGS, and

BEST COPY AVAILABLE

FEMA, as well as interested citizens, attended these meetings. The study was acceptable to the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Douglas County, Oregon. Not included in the study area are the Cities of Drain, Elkton, Glendale, Canyonville, Oakland, Reedsport, Riddle, Myrtle Creek, Roseburg, Sutherlin, Winston, and Yoncalla. Flooding information has been shown in certain areas of Cow Creek Game Refuge, Siuslaw National Forest, and Elliot State Forest. The area of study is shown on the Vicinity Map (Figure 1).

The streams studied in detail were those which were covered by the flood profile study for Douglas County (References 1, 2, and 3).

The Umpqua River was studied in detail from the Pacific Ocean to the confluence with the North and South Umpqua Rivers. The North Umpqua River was studied in detail from its mouth to Idleyld Park. The South Umpqua River was studied in detail from its mouth to Clough Gulch, 3 miles downstream from Days Creek.

The Umpqua River tributary streams which were studied in detail are Scholfield Creek, from its mouth in Reedsport to the confluence with Wind Creek, and Smith River, from its mouth to the confluence with Sulphur Springs.

The South Umpqua River tributaries which were studied in detail are Deer Creek, from Roseburg to Tucker Creek; North Myrtle Creek and South Myrtle Creek, each 2 miles upstream from their confluence; Lower Cow Creek, from its mouth to the gaging station near Riddle; and Cow Creek, from below Glendale to near Anchor.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through 1989.

Elk Creek, from the lower end of Putnam Valley to the upper end of Scotts Valley; Yoncalla Creek, a tributary to Elk Creek; Calapooya Creek, from the confluence with Oldham Creek to the mouth; Newton Creek, east of State Highway 99 in the north suburbs of Roseburg; Lookingglass Creek, Olalla Creek, and Tenmile Creek, all west of Winston; Rice Creek and Willis Creek, both south of Dillard; and South Umpqua River, from Clough Gulch to Tiller, were studied by approximate methods.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and

BEST COPY AVAILABLE

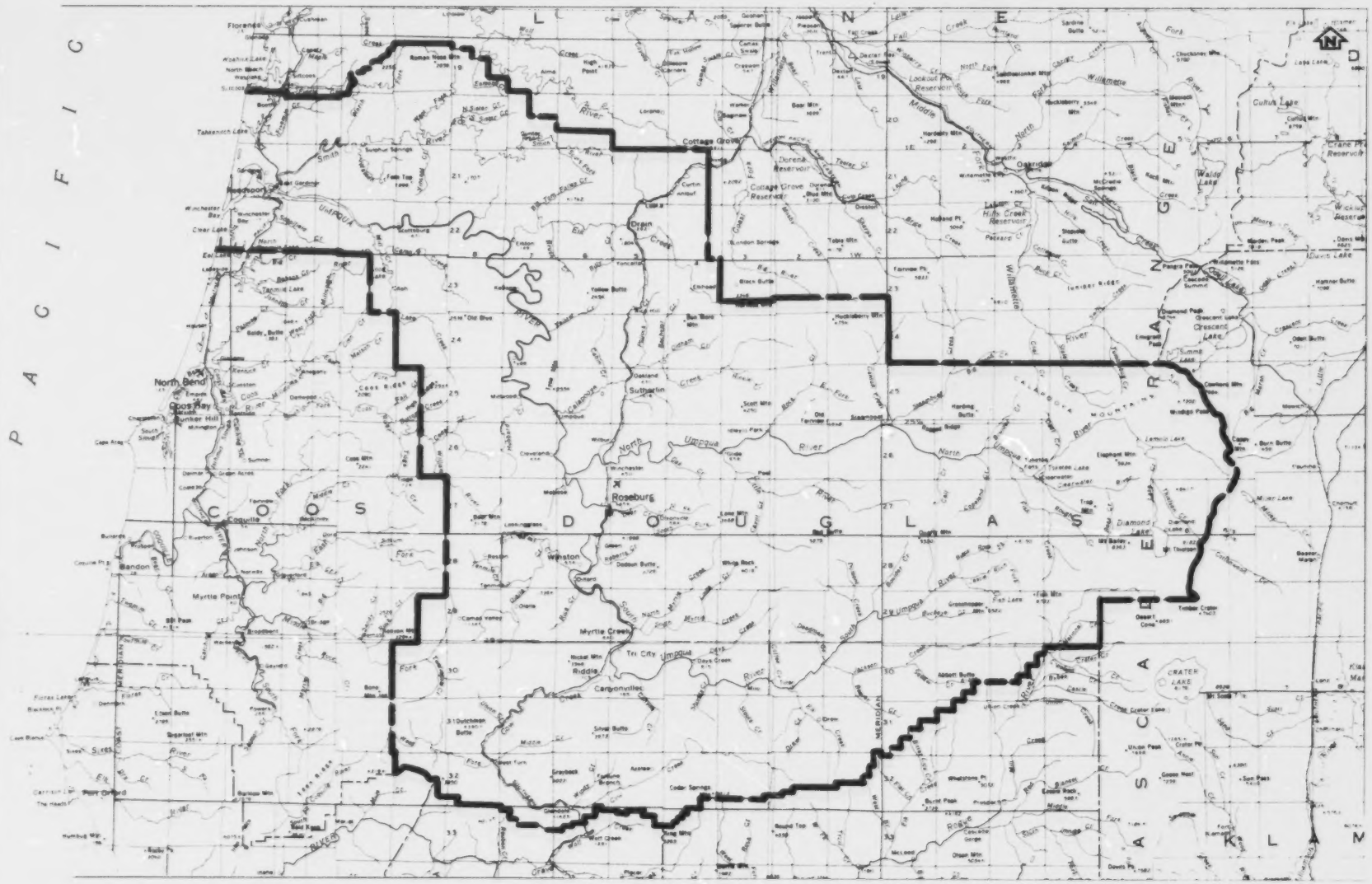

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

APPROXIMATE SCALE

16 0 16 32 48MILES

VICINITY MAP

BEST COPY AVAILABLE

methods of study were proposed to, and agreed upon by, FEMA and Douglas County.

2.2 Community Description

Douglas County is located in southwestern Oregon. It is bounded by Coos County, the Pacific Ocean, and the Coast Range on the west, Curry County on the southwest, Lane County and the Coast and Cascade Ranges on the north, Jackson and Josephine Counties and the Klamath Mountains on the south, and Klamath County and the Western Cascade and High Cascade Ranges on the east.

Most of the county is mountainous and densely forested. Central valleys of broad flood plains and gently rolling upland hills extend from Days Creek northerly to Drain. The valleys along the Umpqua and South Umpqua Rivers are generally from 0.75 to 1.5 miles wide and are connected by fairly narrow canyons.

Elevations range from sea level at Reedsport, to approximately 3,000 feet at the summit of the Coast Range, and to approximately 8,000 feet along the crest of the Cascade Range. The elevation at Roseburg is less than 500 feet; the elevation at Glendale on upper Cow Creek is 1,400 feet.

The Umpqua, North Umpqua, and South Umpqua Rivers are the largest streams in Douglas County. The South Umpqua River heads in the Western Cascade Range and flows through the Klamath Mountains to join the North Umpqua River in Garden Valley. The Western Cascade Range is composed of deeply dissected, moderately permeable rocks. The Klamath Mountains have steep slopes and poorly permeable rocks. The North Umpqua River heads in the highly permeable volcanic rocks of the High Cascade Range and flows through the Western Cascade Range to join the South Umpqua River. Above Garden Valley, the North Umpqua River is deeply entrenched and flows through canyons that connect narrow valleys. The Umpqua River, which heads at the confluence of the North Umpqua and South Umpqua Rivers, flows through the Coast Range, which is characterized by steep slopes and poorly permeable rocks. The Umpqua River empties into the Pacific Ocean near Reedsport.

The climate of Douglas County, like that of western Oregon in general, is characterized by mild, wet winters and hot, dry summers. The pattern of annual precipitation reflects the orographic barriers of the Coast and Cascade Ranges. Average annual precipitation in the Coast Range varies from 50 to 110 inches; in the central valleys, from 25 to 50 inches; and, in the Cascade Range, from 50 to 75 inches (Reference 4). At high elevations, much of the winter precipitation occurs as snow.

Average temperatures at Roseburg range from an average daily minimum of 33°F in January to an average daily maximum of 84°F in July and

BEST COPY AVAILABLE

August. The corresponding average daily minimum and daily maximum temperatures at Reedsport range from 37°F in January to 70°F in August (Reference 4).

The population of Douglas County was 93,748 in 1980 (Reference 5). This represents a 23 percent increase over the 1970 population of 71,743. The majority of the population is concentrated in the central valleys between the Cities of Days Creek and Drain.

The economy of Douglas County is dependent primarily on forest products and agriculture. There is a nickel mining and smelting operation at Riddle. The flood plains of the South Umpqua and Umpqua Rivers are primarily agricultural land, although the community of Dillard is almost entirely on the flood plain of the South Umpqua River.

2.3 Principal Flood Problems

The highest streamflows in the Umpqua River basin usually occur during November through March as a result of heavy winter rains augmented by snowmelt.

Most of the flooding occurs in the valley areas of the South Umpqua and Umpqua Rivers, although the tributary streams of Cow Creek, Calapooya Creek, and Elk Creek also have extensive flood plains. Most of the land subject to flooding along the South Umpqua River is below Days Creek. Because these valleys are the most densely populated and intensively developed in Douglas County, the principal flood problems occur along this stream. A flood potential also exists along the Umpqua River between Elkton and the confluence of the North and South Umpqua Rivers. In the Glendale-Azalea valley of Cow Creek, much bank erosion and channel shifting occurs during floods.

The valleys of the Umpqua River basin have a history of frequent flooding. Major flooding occurred in 1861, 1890, 1927, 1953, 1955, 1964, and 1971 (References 1, 2, 3, and 4). The flood of January 1974 was a major event in the Glendale-Azalea valley of Cow Creek, in the southernmost part of the Umpqua River basin. The flood of December 1964 was a widespread, outstanding flood throughout the entire basin, although it has been exceeded by storms concentrated in tributary basins. The flood of December 1964 had a recurrence interval of approximately 100 years on the Umpqua, North Umpqua, and South Umpqua Rivers. The flood of December 1964 caused damage totaling $25,732,000. Of this total, more than $5 million was for agricultural damage, approximately $6.5 million for residential damage, nearly $3 million for commercial, nearly $2 million for industrial, nearly $3 million for utility, and more than $6 million for highway damage (Reference 6).

BEST COPY AVAILABLE

Very little is known about the floods of 1861 and 1890. At the gaging station on the Umpqua River near Elkton, local residents in 1935 pointed out a high-water mark of the 1861 flood, which was equaled by the December 1955 flood, and exceeded only by the flood of December 1964. At the gaging station on the South Umpqua River near Brockway, the flood of February 1890 was 1.9 feet higher than the flood of February 1927, according to a resident who lived nearby at the time of both floods. The flood of 1890 was exceeded only by the flood of December 1964. It is difficult to determine the discharge of the floods of 1861 and 1890 because of probable changes in the hydraulic carrying capacity of the river channel over an extended period of time.

2.4 Flood Protection Measures

The only significant flood protection structure in the Umpqua River basin is the levee surrounding downtown Reedsport. This levee system, built by the COE following the historic flood of December 1964, was designed to protect against the 200-year flood.

There are old levees along the lower 7 miles of the Smith River, but these are overtopped by a 10-year flood.

Douglas County also enacted an ordinance to control new building on the 100-year flood plain.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

BEST COPY AVAILABLE

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

A regional analysis by the COE in 1969 (Reference 7) was used for the Smith River and Scholfield Creek. For all other streams studied in detail, the annual peak discharge data were analyzed by the standard log-Pearson Type III method, as described in U.S. Water Resources Council Bulletin 15 (Reference 8). Discharges for the 500-year floods were determined by extrapolation of the frequency graph defined to 200 years.

The gaging station on the Umpqua River is near the bridge located 8 miles upstream from Elkton. On the North Umpqua River, a gaging station is located 1.8 miles upstream from the mouth, near Winchester. The site of a former gage on the North Umpqua River is near the bridge located 1 mile downstream from Glide. On the South Umpqua River, one gaging station is at the U.S. Highway 99 bridge north of Winston and another is at Tiller. The gaging station on Deer Creek is 3 miles east of Roseburg. The gage on North Myrtle Creek is 2 miles upstream from the mouth. The gage on South Myrtle Creek is 7 miles from the mouth. One gage on Cow Creek is 4 miles west of Riddle; another gage is located 5 miles northeast of Azalea.

On the Umpqua River, 67 years of flood peak data were available for the frequency analysis. On the North Umpqua and South Umpqua Rivers, 31 years and 42 years of flood peak data were available, respectively. Deer, Myrtle, and Cow Creeks had 18, 16, and 46 years of streamflow records, respectively. These frequency analyses were done during the period from 1971 to 1974 as part of flood profile studies for Douglas County (References 1, 2, and 3).

Peak discharge-drainage area relationships for the Umpqua River, the Smith River, Scholfield Creek, the North Umpqua River, the South Umpqua River, Deer Creek, South Myrtle Creek, North Myrtle Creek, and Cow Creek are shown in Table 1.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

The profiles and supporting data were prepared during the period from 1971 to 1975 by the USGS as part of the flood profile studies for the Douglas County Planning Department (References 1, 2, and 3). For the streams studied in detail, water-surface elevations of floods of the selected recurrence intervals were computed using the USGS step-backwater computer program (Reference 9). Channel

BEST COPY AVAILABLE

Table 1. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Umpqua River					
Near Elkton	3,683	175,000	256,000	294,000	385,000
Smith River					
Below Confluence With North Fork	350	33,000	44,000	50,000	65,000
Above Confluence With North Fork	230	24,000	33,000	38,000	50,000
Scholfield Creek					
Above Confluence With Oar Creek	12.9	1,600	2,000	2,300	2,900
North Umpqua River					
At Winchester	1,344	76,900	120,000	142,000	200,000
Near Glide	1,210	72,000	114,000	135,000	191,000
South Umpqua River					
Near Brockway	1,670	90,300	116,000	124,000	139,000
At Tiller	449	96,300	59,600	71,600	105,000
Deer Creek					
Near Roseburg	53.2	6,820	8,760	9,520	11,500
South Myrtle Creek					
1 Mile Above Mouth	54	3,260	4,440	4,950	6,100
North Myrtle Creek					
At Mouth	44	2,950	3,930	4,350	5,300
Cow Creek					
Near Riddle	456	37,300	48,500	52,400	60,000
Near Azalea	78.0	5,820	8,260	9,160	11,000

BEST COPY AVAILABLE

geometry data required for a step-backwater analysis were furnished by a commercial photogrammetry firm (Reference 10). Cross section locations were spotted on aerial photographs (Reference 10) by the USGS at intervals of approximately 1,000 feet along the channel, and were extended across the flood plain by the photogrammetry contractor. Water-depth soundings made in the field by the USGS were used to complete the photogrammetric cross sections.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

All bridges were examined in the field. The dimensions of those judged to have a significant constricting effect on floodflows were measured and included in the profile computations.

Channel roughness coefficients (Manning's "n") required in the hydraulic computations were selected in the field for subreaches through each cross section. Written descriptions of the bed material and color-slide photographs of the channel were used to aid in office review of the coefficients selected. The aerial photographs were used as aids in the selection of roughness coefficients for the flood plain (Reference 10).

Channel roughness coefficients ranged from 0.030 to 0.055, except in the lower reaches of the Smith and Umpqua Rivers, where "n" values as low as 0.015 were required to compute a sufficiently flat profile to match the high-water marks. Flood plain roughness values ranged from 0.035 for open pasture to 0.125 for dense thickets of brush. Higher values of "n" were used in areas where water was ponded behind roadway fills or where part of the cross section was obstructed by buildings.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

The profile stationing for the Umpqua River is broken into three segments: (1) The Pacific Ocean to Scottsburg, (2) Scottsburg bridge to Hubbard Creek, (3) Hubbard Creek to the confluence of the North Umpqua and South Umpqua Rivers. Similarly, there is a break in the North Umpqua River profile stationing at Winchester Dam, so that the North Umpqua River profiles are broken into two segments.

At the confluence of the North Umpqua and South Umpqua Rivers, hydraulic conditions are not suitable for computation of profiles because of the very sharp horseshoe meander of the South Umpqua River, the wide overflow across the meander, and the mingling of

BEST COPY AVAILABLE

the overflow of the two streams. For this area, the 100-year profile was estimated from high-water marks.

For the Umpqua River, below the Smith River, in Reedsport and Gardiner, flood profiles were established based on tidal elevations for the Pacific Ocean. Channel geometry was not available for this reach and, therefore, was not shown on the flood profiles.

Several streams were studied by approximate methods using the various data available.

For Elk Creek and Yoncalla Creek, in the vicinity of Drain, a USGS flood profile study was extended to estimate the 100-year profile (Reference 11).

For Calapooya Creek, cross sections and profile data were obtained from unpublished data collected by the U.S. Soil Conservation Service.

For the South Umpqua River, approximate elevations were determined using an approximate increment of flood elevation above median low water.

Approximate elevations for Newton, Lookingglass, Rice, Olalla, Tenmile, and Willis Creeks were determined by field reconnaissance, with the help and concurrence of the Douglas County Water Resources Survey.

The Douglas County Water Resources Survey furnished the location of many high-water marks, which were used to verify the computed profiles.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program (NFIP) encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream

BEST COPY AVAILABLE

studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800, with a contour interval of 5 feet (Reference 10).

For the Umpqua River below The Point, flood boundaries were interpolated using topographic maps at a scale of 1:62,500 with a contour interval of 80 feet (Reference 12).

For the area in the vicinity of Winchester Bay, flood boundaries were determined photogrammetrically using aerial photography at a scale of 1:12,000 (Reference 13).

The 100- and 500-year flood plain boundaries are shown on the Flood Boundary and Floodway Map (Exhibit 2). In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For those areas studied by approximate methods, the flood boundaries were plotted on USGS topographic maps, enlarged to a scale of 1:24,000 (Reference 12).

For the South Umpqua River from Days Creek to Tiller, the approximate boundaries were plotted on a topographic map at a scale of 1:24,000, with a contour interval of 5 feet, obtained from the COE (Reference 14).

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River							
A	66,165	3089/2379[2]	54,600	6.0	13.0	12.0	1.0
B	68,055	2737/2167[2]	47,900	6.9	13.1	12.1	1.0
C	71,205	2,099	52,600	6.3	13.9	12.9	1.0
D	72,885	2,631	55,000	6.0	14.1	13.1	1.0
E	74,745	2,097	48,700	6.8	14.3	13.4	0.9
F	76,455	1,255	37,100	8.9	14.3	13.4	0.9
G	79,135	1,082	33,200	9.9	14.8	13.9	0.9
H	82,655	1,249	39,100	8.4	15.8	15.1	0.7
I	84,485	1,368	39,600	8.3	16.0	15.3	0.7
J	86,805	1,765	40,400	8.1	16.4	15.7	0.7
K	88,830	2,326	48,400	6.8	17.0	16.3	0.7
L	92,590	1,974	46,800	7.0	17.5	16.9	0.6
M	94,190	2,010	47,500	6.9	17.7	17.1	0.6
N	98,385	2,140	51,900	6.3	18.5	17.8	0.7
O	100,010	1,670	42,900	7.7	18.6	17.9	0.7
P	102,850	1,687	40,700	8.1	19.0	18.4	0.6
Q	104,985	1,385	34,200	9.6	19.1	18.6	0.5
R	106,720	993	29,700	11.1	19.3	18.8	0.5
S	107,925	1,176	35,900	9.2	20.1	19.5	0.6
T	110,625	1,556	38,000	8.6	20.8	20.2	0.6
U	112,760	1,444	42,100	7.8	21.5	20.9	0.6
V	115,175	903	30,000	11.0	21.7	21.1	0.6
W	117,120	1,292	40,500	8.1	22.9	22.2	0.7
X	119,335	1,047	37,000	8.9	23.4	22.8	0.6
Y	121,765	873	27,200	12.1	23.5	22.9	0.6
Z	122,835	1,092	32,500	10.1	24.6	23.7	0.9

[1]Feet Above Mouth [2]Width/Width Within County Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (Cont'd)							
AA	125,305[1]	919	32,000	10.3	25.4	24.5	0.9
AB	127,545[1]	697	25,200	13.1	25.6	24.7	0.9
AC	128,590[1]	805	30,600	10.8	26.8	25.9	0.9
AD	129,540[1]	703	28,700	11.5	26.8	26.0	0.8
AE	130,885[1]	560	22,100	14.9	26.8	26.0	0.8
AF	132,030[1]	645	26,300	12.5	28.2	27.4	0.8
AG	135,000[1]	822	28,700	11.5	29.9	29.1	0.8
AH	135,905[1]	749	26,100	12.6	30.3	29.5	0.8
AI	136,660[1]	831	30,100	10.9	31.7	31.0	0.7
AJ	138,825[1]	656	25,700	12.8	33.6	32.9	0.7
AK	139,465[1]	942	33,100	10.0	35.2	34.4	0.8
AL	141,280[1]	851	30,900	10.7	36.6	35.9	0.7
AM	142,410[1]	905	31,200	10.5	37.6	36.9	0.7
AN	144,860[1]	709	28,700	11.5	39.6	38.9	0.7
AO	145,765[1]	744	30,100	10.9	40.6	39.6	1.0
AP	220[2]	687	30,500	10.8	41.2	40.2	1.0
AQ	2,675[2]	624	27,400	12.0	42.6	41.7	0.9
AR	3,535[2]	685	29,000	11.4	43.6	42.7	0.9
AS	4,470[2]	619	26,200	12.6	44.2	43.4	0.8
AT	5,715[2]	813	28,000	11.8	45.6	44.7	0.9
AU	7,480[2]	654	28,200	11.6	47.5	46.6	0.9

[1]Feet Above Mouth [2]Feet Above Scottsburg Bridge

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
AV	8,600	749	32,000	10.3	49.0	48.0	1.0
AW	9,690	618	25,000	13.2	49.8	48.9	0.9
AX	11,655	543	24,800	13.3	52.5	51.7	0.8
AY	12,630	612	25,400	13.0	54.4	53.7	0.7
AZ	13,995	790	32,100	10.1	57.9	56.9	1.0
BA	16,535	928	32,900	9.8	59.0	58.2	0.8
BB	17,915	814	31,800	10.2	59.5	58.6	0.9
BC	19,250	1,221	25,200	12.8	59.6	58.8	0.8
BD	20,500	1,007	32,100	10.1	61.4	60.5	0.9
BE	22,820	940	32,900	9.8	62.5	61.6	0.9
BF	25,232	768	29,300	11.0	63.6	62.6	1.0
BG	26,232	1,050	34,900	9.3	64.5	63.5	1.0
BH	27,297	997	32,900	9.8	64.9	64.0	0.9
BI	28,387	1,209	37,200	8.7	65.7	64.7	1.0
BJ	30,607	826	30,600	10.6	66.4	65.6	0.8
BK	31,587	937	31,200	10.4	66.9	66.1	0.8
BL	32,150	594	26,700	12.1	67.0	66.2	0.8
BM	33,063	1,134	30,500	10.6	67.8	67.0	0.8
BN	34,320	710	29,000	11.2	68.7	67.8	0.9
BO	36,338	564	27,600	11.7	69.6	68.8	0.8
BP	37,543	713	32,500	10.0	70.4	69.6	0.8
BQ	39,433	606	26,900	12.0	70.6	69.8	0.8
BR	41,658	553	24,100	13.4	71.4	70.8	0.6

[1]Feet Above Scottsburg Bridge

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
BS	42,883	770	28,200	11.5	72.4	71.8	0.6
BT	44,013	1,210	31,800	10.2	73.3	72.8	0.5
BU	46,213	700	28,400	11.4	74.0	73.3	0.7
BV	47,263	614	29,700	10.9	74.5	74.0	0.5
BW	48,403	800	28,700	11.3	74.8	74.2	0.6
BX	50,343	742	36,500	8.9	76.2	75.5	0.7
BY	51,330	654	27,300	11.9	76.2	75.5	0.7
BZ	53,355	800	33,800	9.6	77.5	76.8	0.7
CA	54,305	739	27,200	11.9	77.7	76.9	0.8
CB	56,305	852	29,200	11.1	79.5	78.8	0.7
CC	58,605	744	24,600	13.2	81.1	80.6	0.5
CD	60,995	617	24,100	13.4	83.4	82.8	0.6
CE	61,895	773	25,800	12.6	84.6	84.1	0.5
CF	62,722	714	24,000	13.5	84.7	84.3	0.4
CG	64,017	1,356	27,300	11.9	85.8	85.3	0.5
CH	65,452	574	21,100	15.4	86.9	86.5	0.4
CI	66,875	650	23,200	14.0	88.9	88.5	0.4
CJ	69,392	554	22,800	14.2	90.6	90.1	0.5
CK	72,125	584	24,000	13.5	92.8	92.3	0.5
CL	73,535	886	32,600	10.0	95.2	94.4	0.8
CM	76,210	623	26,600	12.2	96.1	95.3	0.8
CN	79,160	850	32,000	10.1	98.4	97.8	0.6
CO	80,775	1,005	30,500	10.6	99.6	99.0	0.6

[1]Feet Above Scottsburg Bridge

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
CP	82,045	583	25,800	12.6	100.5	99.7	0.8
CQ	82,880	527	21,800	14.9	101.0	100.2	0.8
CR	83,830	631	27,600	11.7	103.0	102.4	0.6
CS	84,510	566	26,700	12.1	103.1	102.6	0.5
CT	85,440	1,160	41,500	7.8	104.3	103.6	0.7
CU	86,445	1,481	43,400	7.5	104.6	103.9	0.7
CV	87,765	1,859	43,900	7.4	104.9	104.3	0.6
CW	88,885	613	24,700	13.1	104.9	104.3	0.6
CX	90,625	728	25,700	12.6	106.3	105.4	0.9
CY	92,510	924	27,500	11.8	107.6	106.9	0.7
CZ	94,685	700	28,500	11.4	109.0	108.3	0.7
DA	95,860	570	25,200	12.9	109.2	108.6	0.6
DB	97,095	837	32,400	10.0	110.4	109.8	0.6
DC	98,555	631	24,700	13.1	110.9	110.3	0.6
DD	99,835	898	27,500	11.8	111.6	111.0	0.6
DE	100,985	850	31,400	10.3	112.9	112.2	0.7
DF	102,345	1,300	36,900	8.8	113.6	112.8	0.8
DG	104,705	800[2]	35,900	9.0	114.9	114.1	0.8
DH	107,440	714[2]	35,800	9.1	117.9	117.1	0.8
DI	108,135	900[2]	33,900	9.6	118.6	117.7	0.9
DJ	110,085	1,759	37,700	7.8	120.8	119.8	1.0
DK	110,412	2,094	45,400	6.5	121.3	120.3	1.0
DL	111,349	2,365	47,700	6.2	121.6	120.6	1.0

[1]Feet Above Scottsburg Bridge [2]This Width Extends Beyond Study Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
DM	112,182	2,525	47,500	6.2	121.8	120.8	1.0
DN	113,699	1,386	32,800	9.0	122.0	121.0	1.0
DO	116,232	968	29,900	9.8	122.9	121.9	1.0
DP	117,342	1,096	30,100	9.8	123.5	122.5	1.0
DQ	118,587	1,539	40,300	7.3	124.7	123.7	1.0
DR	119,600	2,450	46,100	6.4	125.0	124.0	1.0
DS	120,563	2,250	38,100	7.7	125.2	124.2	1.0
DT	121,568	2,700	40,200	7.3	125.8	124.8	1.0
DU	122,403	2,120	37,500	7.8	126.2	125.2	1.0
DV	123,560	1,335	34,700	8.5	126.7	125.8	0.9
DW	124,635	1,781	30,800	9.5	127.2	126.3	0.9
DX	125,643	2,261	39,000	7.5	128.2	127.3	0.9
DY	127,725	1,779	34,100	8.6	128.9	128.0	0.9
DZ	128,705	2,500	52,400	5.6	129.9	128.9	1.0
EA	130,045	2,429	50,800	5.8	130.8	129.8	1.0
EB	132,165	2,074	32,000	9.2	131.3	130.4	0.9
EC	134,090	2,241	33,300	8.8	132.9	131.9	1.0
ED	136,090	2,600	46,600	6.3	134.4	133.5	0.9
EE	137,215	3,479	62,600	4.7	135.2	134.3	0.9
EF	139,700	2,759	42,200	7.0	135.8	134.8	1.0
EG	141,820	1,443	31,100	9.5	136.6	135.9	0.7
EH	143,125	1,059	28,400	10.4	137.2	136.5	0.7
EI	145,695	482	19,800	14.9	137.8	137.1	0.7

[1]Feet Above Scottsburg Bridge

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
EJ	148,650	586	25,800	11.4	141.6	140.7	0.9
EK	151,285	714	29,200	10.1	143.6	142.7	0.9
EL	154,130	595	26,100	11.3	145.4	144.5	0.9
EM	155,855	786	32,500	9.0	147.2	146.5	0.7
EN	156,755	690	28,300	10.4	147.6	146.8	0.8
EO	158,850	760	29,000	10.1	149.1	148.4	0.7
EP	161,150	613	22,600	13.0	150.7	150.0	0.7
EQ	162,350	650	24,900	11.8	152.7	152.2	0.5
ER	163,600	547	24,400	12.0	153.7	153.2	0.5
ES	165,970	619	25,700	11.4	155.8	155.4	0.4
ET	168,440	708	26,500	11.1	157.2	156.8	0.4
EU	170,760	609	34,000	12.3	158.4	158.0	0.4
EV	172,960	566	24,000	12.2	159.8	159.4	0.4
EW	173,905	803	28,300	10.4	161.1	160.6	0.5
EX	175,090	670	27,000	10.9	161.6	161.1	0.5
EY	177,790	711	26,700	11.0	163.1	162.6	0.5
EZ	179,010	541	21,700	13.5	163.7	163.2	0.5
FA	179,865	755	29,900	9.8	165.7	165.2	0.5
FB	181,080	693	25,700	11.4	166.3	165.8	0.5
FC	183,275	821	27,500	10.7	168.1	167.7	0.4
FD	185,435	708	24,200	12.1	169.4	168.9	0.5
FE	186,445	985	32,200	9.1	171.1	170.7	0.4
FF	187,500	1,318	42,600	6.9	172.6	172.2	0.4

[1]Feet Above Scottsburg Bridge

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
FG	188,550	1,206	38,800	7.6	173.3	173.1	0.2
FH	189,495	680	25,300	11.6	174.0	173.7	0.3
FI	190,525	730	26,500	11.1	175.7	175.2	0.5
FJ	191,585	624	25,100	11.7	176.7	176.2	0.5
FK	192,730	697	24,300	12.1	177.9	177.4	0.5
FL	194,805	607	25,100	11.7	180.4	180.0	0.4
FM	196,070	530	22,400	13.2	181.1	180.8	0.3
FN	197,905	602	25,000	11.7	183.4	183.2	0.2
FO	198,715	681	27,000	10.9	184.3	184.1	0.2
FP	199,960	593	24,100	12.2	185.0	184.7	0.3
FQ	200,830	685	25,400	11.6	185.5	185.4	0.1
FR	201,740	837	29,900	9.8	186.5	186.2	0.3
FS	203,415	653	26,700	11.0	187.2	186.8	0.4
FT	204,405	1,003	29,200	10.1	188.1	187.6	0.5
FU	205,370	609	25,500	11.5	188.6	188.2	0.4
FV	206,335	574	21,900	13.4	189.0	188.5	0.5
FW	207,345	708	26,500	11.1	190.5	190.0	0.5
FX	210,450	650	25,200	11.7	191.8	191.4	0.4
FY	213,545	534	22,500	13.0	194.4	194.0	0.4
FZ	215,100	679	23,700	12.4	196.2	195.8	0.4
GA	216,305	861	26,800	11.0	198.0	197.5	0.5
GB	218,545	775	27,800	10.6	200.4	199.8	0.6
GC	219,640	707	23,900	12.3	201.0	200.4	0.6

[1]Feet Above Scottsburg Bridge

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
GD	221,750	825	28,800	10.2	203.8	203.1	0.7
GE	224,050	601	25,300	11.6	205.2	204.4	0.8
GF	225,460	691	28,300	10.4	206.5	205.7	0.8
GG	226,805	1,666	36,700	8.0	207.9	207.2	0.7
GH	228,980	1,057	29,100	10.1	209.0	208.3	0.7
GI	230,245	833	28,800	10.2	209.9	209.2	0.7
GJ	232,740	638	26,000	11.3	211.3	210.5	0.8
GK	234,270	850	33,400	8.8	212.8	211.9	0.9
GL	235,385	690	27,600	10.6	213.0	212.2	0.8
GM	236,340	1,155	31,400	9.4	213.5	212.6	0.9
GN	238,085	2,300	39,800	7.4	214.8	213.9	0.9
GO	239,405	2,470	37,900	7.8	215.2	214.2	1.0
GP	240,625	2,015	32,900	8.9	215.6	214.7	0.9
GQ	242,078	1,125	27,400	10.7	216.4	215.5	0.9
GR	245,045	615	27,100	10.9	218.9	218.1	0.8
GS	247,700	853	35,300	8.3	221.2	220.2	1.0
GT	248,880	974	38,200	7.7	221.7	220.8	0.9
GU	249,340	860	33,500	8.8	221.8	220.9	0.9
GV	251,585	572	21,600	13.6	223.6	223.0	0.6
GW	253,845	983	27,100	10.8	226.1	225.7	0.4
GX	255,675	805	26,200	11.2	227.1	226.7	0.4
GY	258,905	640	23,900	12.3	229.3	228.6	0.7
GZ	260,779	770	30,600	9.6	231.3	230.7	0.6

[1]Feet Above Scottsburg Bridge

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
HA	262,949	682	27,200	10.8	232.0	231.3	0.7
HB	264,993	500	22,600	13.0	233.5	232.9	0.6
HC	265,988	610	23,000	12.8	234.3	233.8	0.5
HD	267,328	836	27,800	10.6	236.3	235.4	0.9
HE	269,535	586	23,700	12.4	237.5	236.8	0.7
HF	270,995	677	25,600	11.5	239.2	238.5	0.7
HG	273,352	923	31,300	9.4	243.1	242.6	0.5
HH	274,347	720	23,000	12.8	243.4	243.1	0.3
HI	275,344	793	27,100	10.8	245.2	244.6	0.6
HJ	276,374	1,080	39,400	7.5	247.3	246.6	0.7
HK	277,534	1,234	46,500	6.3	248.7	248.1	0.6
HL	278,784	620	24,900	11.8	249.0	248.3	0.7
HM	280,719	538	22,100	13.3	250.2	249.6	0.6
HN	281,794	737	27,100	10.8	252.0	251.3	0.7
HO	282,907	1,054	27,900	10.5	253.0	252.5	0.5
HP	284,029	688	25,100	11.7	254.0	253.4	0.6
HQ	285,029	524	23,000	12.8	254.8	254.2	0.6
HR	286,877	695	27,200	10.8	257.5	257.0	0.5
HS	289,312	1,462	38,500	7.6	259.8	259.3	0.5
HT	290,367	1,582	37,600	7.8	260.3	259.8	0.5
HU	292,777	892	32,600	9.0	262.2	261.6	0.6
HV	293,907	1,160	33,200	8.9	263.6	262.8	0.8
HW	295,115	1,035	35,600	8.2	264.8	264.2	0.6

[1]Feet Above Scottsburg Bridge

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
HX	297,470	657	25,500	11.5	266.4	265.9	0.5
HY	299,415	552	22,000	13.4	267.5	267.0	0.5
HZ	302,148	687	24,000	12.2	270.2	269.8	0.4
IA	305,143	667	22,900	12.8	273.1	272.6	0.5
IB	306,623	660	22,800	12.9	274.8	274.2	0.6
IC	308,697	702	23,000	12.8	277.2	276.3	0.9
ID	309,797	920	25,600	11.5	278.9	278.2	0.7
IE	310,757	880	26,200	11.2	280.2	279.6	0.6
IF	312,621	600	26,000	11.3	281.9	281.4	0.5
IG	313,766	665	22,300	13.2	282.5	282.0	0.5
IH	314,616	544	20,600	14.3	283.2	282.8	0.4
II	316,553	785	24,400	12.1	286.1	285.6	0.5
IJ	318,830	611	23,800	12.4	288.1	287.4	0.7
IK	319,673	570	23,500	12.5	288.7	288.0	0.7
IL	321,358	1,070	33,400	8.8	291.1	290.4	0.7
IM	322,358	745	26,000	11.3	291.2	290.6	0.6
IN	323,395	1,430	32,700	9.0	292.1	291.5	0.6
IO	324,435	1,510	30,800	9.6	292.6	292.0	0.6
IP	325,402	2,044	32,700	9.0	293.0	292.4	0.6
IQ	326,687	883	24,800	11.3	293.8	293.1	0.7
IR	328,472	722	25,000	11.1	295.2	294.6	0.6
IS	330,222	805	30,100	9.3	297.2	296.4	0.8
IT	332,382	547	19,700	14.2	298.6	298.0	0.6
IU	333,622	718	24,400	11.4	301.4	300.9	0.5

[1]Feet Above Scottsburg Bridge

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
IV	335,557[1]	637	24,700	11.3	304.0	303.6	0.4
IW	337,909[1]	642	24,400	11.4	305.8	305.4	0.4
IX	339,184[1]	745	24,200	11.5	307.2	306.8	0.4
IY	340,339[1]	656	23,900	11.7	308.2	307.9	0.3
IZ	341,394[1]	800	26,000	10.7	309.5	309.2	0.3
JA	342,394[1]	678	26,200	10.6	310.4	310.2	0.2
JB	344,119[1]	760	22,100	12.6	311.5	311.2	0.3
JC	346,794[1]	560	20,800	13.4	314.8	314.4	0.4
JD	347,939[1]	690	24,500	11.4	316.8	316.2	0.6
JE	350,142[1]	570	23,000	12.1	318.5	317.9	0.6
JF	350,967[1]	675	27,000	10.4	319.6	319.0	0.6
JG	352,197[1]	600	24,100	11.6	320.0	319.5	0.5
JH	354,526[1]	660	24,300	11.5	322.0	321.6	0.4
JI	356,813[1]	780	31,100	9.0	324.3	323.7	0.6
JJ	359,408[1]	900	31,000	9.0	326.2	325.5	0.7
JK	360,238[1]	790	26,000	10.7	326.6	325.8	0.8
JL	362,539[1]	660	25,400	11.0	328.0	327.4	0.6
JM	365,452[1]	646	21,500	13.0	330.1	329.6	0.5
JN	367,045[1]	550	18,600	15.0	331.8	331.4	0.4
JO	368,080[1]	612	21,300	13.1	333.9	333.5	0.4
JP	369,745[1]	920	33,200	8.4	336.7	336.0	0.7
JQ	371,203[1]	605	22,500	12.4	337.0	336.3	0.7
JR	1,000[2]	670	25,000	10.6	340.5	339.5	1.0

[1]Feet Above Scottsburg Bridge [2]Feet Above Hubbard Creek

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
JS	2,110	963	32,300	8.2	342.1	341.2	0.9
JT	3,000	788	26,300	10.0	342.6	341.7	0.9
JU	4,000	1,157	29,700	8.9	344.6	343.6	1.0
JV	6,000	789	25,500	10.4	348.0	347.3	0.7
JW	7,000	1,089	34,000	7.8	349.8	349.0	0.8
JX	7,760	1,272	41,500	6.4	350.3	349.5	0.8
JY	9,000	2,144	51,400	5.1	350.8	350.0	0.8
JZ	11,000	3,199	50,900	5.2	351.2	350.4	0.8
KA	12,630	3,519	52,200	5.1	351.7	350.9	0.8
KB	14,400	2,601	37,200	7.1	351.9	351.0	0.9
KC	17,300	3,442	44,800	5.9	353.8	352.8	1.0
KD	19,420	4,206	46,300	5.7	354.8	353.8	1.0
KE	21,140	4,943	43,600	6.1	355.7	354.8	0.9
KF	23,245	5,950	44,800	5.4	357.4	356.4	1.0
KG	25,275	7,650	58,700	4.1	358.2	357.2	1.0
KH	27,360	2,995	27,200	8.9	358.4	357.4	1.0
KI	28,735	1,049	23,100	10.5	359.1	358.2	0.9
KJ	30,480	639	22,000	11.1	360.0	359.2	0.8
KK	33,500	422	18,700	13.0	363.5	363.1	0.4
KL	34,600	696	25,600	9.5	365.9	365.3	0.6
KM	35,600	1,138	32,000	7.6	367.1	366.5	0.6
KN	37,400	1,307	39,700	6.1	369.0	368.5	0.5
KO	38,400	872	27,900	8.7	369.4	369.0	0.4

[1]Feet Above Hubbard Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Umpqua River (cont'd)							
KP	39,700	551	18,200	13.4	370.6	370.1	0.5
KQ	42,300	705	25,300	9.6	376.0	375.6	0.4
KR	44,795	930	22,600	10.7	377.9	377.4	0.5
KS	46,450	562	18,300	13.3	379.2	378.5	0.7
KT	48,175	1,222	30,800	7.9	382.3	381.8	0.5
KU	50,455	2,559	29,100	8.4	384.2	383.8	0.4
KV	53,340	4,654	44,100	5.5	387.2	386.5	0.7
KW	54,450	5,570	44,700	5.4	387.9	387.0	0.9
KX	55,750	5,420	38,500	6.3	388.6	388.0	0.6
KY	57,405	4,969	32,300	7.5	390.5	390.0	0.5
KZ	59,155	4,000	44,000	5.5	393.2	392.8	0.4
LA	60,610	2,825	29,100	8.4	394.1	393.8	0.3
LB	62,145	2,538	26,800	9.1	395.8	395.2	0.6
LC	63,625	1,800	22,200	11.0	397.1	396.3	0.8
LD	65,260	1,660	25,800	9.4	399.4	398.7	0.7
LE	66,840	1,795	31,600	7.7	401.4	400.7	0.7
LF	68,065	2,458	40,300	6.0	402.4	401.6	0.8

[1]Feet Above Hubbard Creek

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Smith River							
A	6,710	877	15,900	3.1	12.8	11.8	1.0
B	8,400	553	12,300	4.1	12.8	11.8	1.0
C	10,175	458	11,100	4.5	12.8	11.8	1.0
D	12,205	1,147	20,700	2.4	13.0	12.0	1.0
E	14,795	912	17,000	3.0	13.0	12.0	1.0
F	16,705	517	10,100	5.0	13.0	12.0	1.0
G	18,090	850	13,700	3.6	13.2	12.3	0.9
H	19,155	561	11,300	4.4	13.2	12.3	0.9
I	20,155	470	10,700	4.7	13.2	12.3	0.9
J	21,515	873	18,700	2.7	13.5	12.6	0.9
K	24,490	652	13,400	3.7	13.5	12.6	0.9
L	25,665	814	13,100	3.8	13.5	12.6	0.9
M	26,645	720	12,900	3.9	13.5	12.6	0.9
N	28,420	756	13,500	3.7	13.6	12.7	0.9
O	30,655	573	10,200	4.9	13.6	12.7	0.9
P	32,855	337	7,420	6.7	13.6	12.7	0.9
Q	33,835	460	9,010	5.6	13.9	13.1	0.8
R	35,985	413	8,680	5.8	14.1	13.2	0.9
S	37,105	303	7,640	6.5	14.1	13.2	0.9
T	39,175	410	8,660	5.8	14.4	13.6	0.8
U	40,355	301	7,390	6.8	14.4	13.7	0.7
V	42,985	345	7,830	6.4	14.9	14.0	0.9
W	46,050	351	7,630	6.6	15.2	14.4	0.8
X	48,360	230	6,190	8.1	15.4	14.6	0.8
Y	50,670	365	8,640	5.8	16.2	15.4	0.8
Z	52,815	280	7,060	7.1	16.4	15.8	0.6

[1]Feet Above Mouth

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

SMITH RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Smith River (cont'd)							
AA	55,475	253	6,610	7.6	17.0	16.3	0.7
AB	57,640	354	8,210	6.1	17.6	16.9	0.7
AC	59,325	326	7,960	6.3	17.9	17.2	0.7
AD	60,220	277	7,070	7.1	18.0	17.3	0.7
AE	62,155	406	7,880	6.4	18.6	17.8	0.8
AF	63,075	282	7,180	7.0	18.7	18.0	0.7
AG	67,240	340	7,910	6.3	19.8	19.1	0.7
AH	69,390	251	6,580	7.6	20.2	19.4	0.8
AI	72,080	286	8,790	5.7	21.2	20.4	0.8
AJ	74,335	335	7,380	6.8	21.5	20.8	0.7
AK	76,660	285	7,640	6.5	22.4	21.5	0.9
AL	78,080	370	8,580	5.8	22.9	22.0	0.9
AM	79,235	300	7,790	6.4	23.1	22.3	0.8
AN	81,730	751	13,400	3.7	24.0	23.1	0.9
AO	83,445	551	11,000	3.4	24.2	23.3	0.9
AP	84,650	244	5,830	6.5	24.2	23.4	0.8
AQ	85,740	500	9,740	3.9	24.6	23.8	0.8
AR	89,105	236	5,860	6.5	25.7	24.8	0.9
AS	91,185	403	8,040	4.7	26.4	25.4	1.0
AT	93,015	453	9,570	4.0	27.0	26.0	1.0
AU	93,900	280	6,590	5.8	27.1	26.1	1.0
AV	95,370	348	6,930	5.5	27.6	26.6	1.0
AW	96,590	600	9,950	3.8	28.0	27.0	1.0
AX	98,520	263	6,820	5.6	28.8	27.8	1.0
AY	99,580	630	13,400	2.8	29.2	28.2	1.0
AZ	100,565	224	6,180	6.1	29.4	28.4	1.0

[1]Feet Above Mouth

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

SMITH RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Smith River (cont'd)							
BA	101,940	261	6,680	5.7	29.8	28.8	1.0
BB	103,895	211	5,690	6.7	30.4	29.4	1.0
BC	105,020	423	8,800	4.3	31.0	30.0	1.0
BD	107,140	900	12,200	3.1	31.9	30.9	1.0
BE	108,265	210	5,470	7.0	32.0	31.0	1.0
BF	109,895	548	10,500	3.6	33.1	32.1	1.0
BG	111,300	473	10,700	3.6	33.3	32.4	0.9
BH	112,965	581	9,530	4.0	33.6	32.7	0.9
BI	113,965	465	7,890	4.8	33.8	32.8	1.0
Scholfield Creek							
E	24,200	155	1,390	1.7	11.6	10.6	1.0
F	25,105	335	2,560	0.9	11.7	10.7	1.0
G	27,050	107	1,060	2.2	11.7	10.7	1.0
H	28,725	364	2,660	0.9	11.8	10.8	1.0
I	30,525	480	1,510	1.5	11.9	10.9	1.0
J	31,650	334	1,710	1.3	12.0	11.0	1.0
K	32,810	553	3,230	0.7	12.1	11.1	1.0
L	34,730	358	1,580	1.5	12.2	11.3	0.9
M	35,520	71	330	7.0	12.6	11.8	0.8
N	36,925	112	765	3.0	16.0	15.0	1.0
O	37,385	436	2,590	0.9	16.9	16.1	0.8
P	38,030	257	934	2.5	17.1	16.2	0.9
Q	39,870	63	451	5.1	19.9	19.4	0.5
R	40,455	485	2,600	6.9	21.5	21.1	0.4

[1]Feet Above Mouth

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

SMITH RIVER-SCHOLFIELD CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
North Umpqua River							
A	5,425[1]	1,750	20,000	7.1	405.4	404.4	1.0
B	6,065[1]	1,900	20,200	7.0	405.7	404.7	1.0
C	7,490[1]	1,200	18,800	7.6	406.5	405.5	1.0
D	8,685[1]	780	15,500	9.2	407.0	406.1	0.9
E	9,650[1]	1,070	15,300	9.3	408.2	407.2	1.0
F	10,200[1]	1,110	21,300	6.7	409.3	408.3	1.0
G	12,105[1]	969	19,700	7.2	412.5	411.6	0.9
H	13,295[1]	764	17,800	8.0	414.0	413.1	0.9
I	15,630[1]	573	14,400	9.9	416.3	415.6	0.7
J	20,950[1]	460	12,900	11.0	425.6	424.9	0.7
K	22,975[1]	690	14,500	9.8	428.1	427.3	0.8
L	23,975[1]	843	16,700	8.5	430.1	429.8	0.3
M	26,135[1]	638	14,300	9.9	433.3	432.6	0.7
N	29,565[1]	581	13,600	10.5	438.4	437.5	0.9
O	30,415[1]	783	16,100	8.8	439.4	438.6	0.8
P	31,900[1]	452	11,900	11.9	440.3	439.4	0.9
Q	34,230[1]	625	12,600	11.2	445.1	444.7	0.4
R	35,095[1]	855	15,900	8.9	447.2	446.5	0.7
S	36,220[2]	607	15,600	9.1	448.2	447.4	0.8
T	135[2]	590	13,600	10.2	454.4	453.4	1.0
U	2,680[2]	420	11,000	12.6	457.0	456.3	0.7
V	4,280[2]	600	13,500	10.3	459.5	458.8	0.7
W	5,216[2]	876	17,100	8.1	461.0	460.1	0.9
X	6,784[2]	530	11,600	12.0	462.1	461.6	0.5
Y	7,630[2]	757	18,500	7.5	464.8	464.0	0.8
Z	9,304[2]	539	12,800	10.9	466.3	465.5	0.8

[1]Feet Above Mouth [2]Feet Above Winchester Dam

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
North Umpqua River (cont'd)							
AA	11,560	817	16,300	8.5	472.1	471.8	0.3
AB	12,312	510	14,700	9.4	473.1	472.8	0.3
AC	13,997	662	13,400	10.4	475.4	475.2	0.2
AD	15,114	550	10,900	12.8	478.2	478.0	0.2
AE	16,569	883	19,100	7.3	483.3	483.0	0.3
AF	17,660	1,079	19,800	7.0	485.1	484.9	0.2
AG	18,424	758	15,500	9.0	486.0	485.9	0.1
AH	19,609	629	14,300	9.7	488.3	488.1	0.2
AI	22,279	541	13,500	10.3	493.4	492.8	0.6
AJ	24,739	429	11,400	12.2	497.2	496.5	0.7
AK	27,254	692	14,500	9.6	502.8	501.8	1.0
AL	29,184	503	10,300	13.5	506.1	505.2	0.9
AM	31,459	485	11,600	12.0	511.7	510.7	1.0
AN	33,699	596	13,100	10.6	515.9	515.2	0.7
AO	35,069	535	12,900	10.7	519.1	518.4	0.7
AP	37,117	409	10,700	13.0	523.0	522.4	0.6
AQ	39,702	640	14,600	9.5	528.6	527.7	0.9
AR	40,916	441	10,800	12.8	531.1	530.5	0.6
AS	43,325	583	13,300	10.4	537.6	537.0	0.6
AT	44,840	706	15,600	8.9	539.4	538.6	0.8
AU	47,405	460	9,720	14.3	541.4	540.9	0.5
AV	48,553	670	11,100	12.5	544.1	543.1	1.0
AW	49,883	440	9,560	14.5	545.9	545.4	0.5
AX	52,730	730	13,164	10.6	551.4	550.8	0.6
AY	53,678	550	9,680	14.4	552.7	552.3	0.4
AZ	55,018	680	14,500	9.6	557.2	557.1	0.1

[1]Feet Above Winchester Dam

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
North Umpqua River (cont'd)							
BA	55,865	480	8,170	17.0	558.2	558.1	0.1
BB	56,700	580	11,400	12.2	563.8	563.8	0.0
BC	58,500	470	12,100	11.5	567.6	567.5	0.1
BD	61,476	600	13,600	10.2	575.5	574.6	0.9
BE	63,596	500	12,500	11.1	578.6	577.6	1.0
BF	65,724	920	18,700	7.2	584.1	583.3	0.8
BG	66,784	600	16,800	8.0	585.7	585.0	0.7
BH	68,116	707	13,600	9.9	588.6	588.0	0.6
BI	70,116	510	11,300	11.9	592.8	592.5	0.3
BJ	72,626	601	14,300	9.5	600.6	599.8	0.8
BK	73,606	631	13,600	9.9	602.6	602.0	0.6
BL	75,791	532	12,200	11.1	607.4	607.2	0.2
BM	76,773	670	16,100	8.4	610.1	609.9	0.2
BN	77,940	359	9,200	14.6	611.9	611.8	0.1
BO	79,072	708	15,300	8.8	617.7	617.1	0.6
BP	80,625	301	11,800	11.4	619.9	619.6	0.3
BQ	81,910	727	17,200	7.8	622.4	621.9	0.5
BR	83,565	429	10,300	13.0	624.6	624.4	0.2
BS	85,670	477	12,600	10.7	630.3	629.9	0.4
BT	86,600	668	14,300	9.5	632.3	631.9	0.4
BU	87,865	546	11,600	11.6	634.1	633.9	0.2
BV	89,615	670	14,500	9.3	638.5	638.4	0.1
BW	91,770	641	15,000	9.0	641.7	641.7	0.0
BX	94,954	594	13,300	10.1	648.5	648.4	0.1
BY	97,394	393	9,470	14.3	652.8	652.6	0.2
BZ	99,624	800	16,200	8.3	658.7	657.9	0.8

[1]Feet Above Winchester Dam

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
North Umpqua River (cont'd)							
CA	100,644	500	12,200	11.1	659.5	658.9	0.6
CB	101,519	630	13,000	10.4	661.2	660.4	0.8
CC	102,545	526	12,800	10.6	662.8	662.1	0.7
CD	104,567	705	13,800	9.8	665.9	665.1	0.8
CE	105,782	755	15,500	8.7	668.0	667.4	0.6
CF	107,727	512	10,200	13.2	672.5	672.3	0.2
CG	109,374	405	10,200	13.3	676.2	676.0	0.2
CH	112,548	580	13,400	10.1	682.8	682.7	0.1
CI	113,868	289	9,600	14.0	684.8	684.7	0.1
CJ	114,888	496	12,500	10.8	688.0	688.0	0.0
CK	115,783	381	8,470	13.1	693.0	692.8	0.2
CL	117,524	376	9,230	12.0	697.6	697.4	0.2
CM	119,259	458	9,860	11.3	700.9	700.8	0.1
CN	120,883	372	10,400	10.6	703.4	703.3	0.1
CO	123,443	519	13,000	8.5	707.1	707.1	0.0
CP	125,637	357	9,680	11.5	709.3	709.3	0.0
CQ	126,382	467	9,870	11.2	710.6	710.5	0.1
CR	127,990	310	7,620	14.6	713.8	713.8	0.0
CS	130,100	394	11,600	9.6	720.2	720.2	0.0
CT	131,415	321	8,650	12.8	721.5	721.5	0.0
CU	133,200	416	10,000	11.1	726.4	726.4	0.0
CV	135,112	256	8,000	13.9	732.3	732.3	0.0
CW	136,663	432	12,100	9.2	736.4	736.4	0.0
CX	137,730	341	10,300	10.8	737.9	737.8	0.1
CY	138,620	391	9,980	11.1	738.9	738.9	0.0
CZ	140,910	297	9,180	12.1	743.4	743.3	0.1

[1]Feet Above Winchester Dam

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
North Umpqua River (cont'd)							
DA	144,005[1]	381	9,940	11.2	749.5	749.4	0.1
South Umpqua River							
A	17,900[2]	4,830	28,600	4.6	402.6	402.2	0.4
B	20,435[2]	4,650	17,700	7.4	403.4	403.2	0.2
C	22,185[2]	3,330	14,400	9.1	404.9	404.4	0.5
D	24,640[2]	2,800[3]	19,000	6.9	407.7	406.7	1.0
E	25,620[2]	1,300[3]	18,400	7.1	408.9	408.0	0.9
F	25,890[2]	2,580	19,800	6.6	409.6	408.6	1.0
G	27,120[2]	2,220	25,200	5.2	411.4	410.7	0.7
H	28,010[2]	1,650	21,900	6.0	412.2	411.6	0.6
I	29,180[2]	1,330	22,700	5.8	413.4	412.9	0.5
J	31,380[2]	500	12,800	10.3	415.6	414.9	0.7
K	32,480[2]	670	15,500	8.4	417.4	416.7	0.7
L	33,595[2]	470	12,500	10.5	418.3	417.6	0.7
M	34,575[2]	676	17,100	7.7	419.9	419.3	0.6
N	35,555[2]	400	12,300	10.6	420.4	419.8	0.6
O	36,555[2]	500	12,400	10.6	421.8	421.0	0.8
P	38,425[2]	418	10,600	12.3	425.1	424.6	0.5
Q	39,250[2]	481[4]	12,200	10.7	427.1	426.4	0.7
R	40,230[2]	635[4]	17,400	7.6	428.9	428.3	0.6
S	41,185[2]	501[4]	13,800	9.5	429.4	428.8	0.6
T	42,065[2]	541[4]	14,400	9.1	430.3	429.7	0.6
U	43,165[2]	803[4]	18,300	7.2	432.0	431.6	0.4
V	45,370[2]	455[4]	14,200	9.2	433.6	433.1	0.5

[1]Feet Above Winchester Dam [2]Feet Above Mouth [3]This Width Does Not Include Islands
[4]This Width Extends Beyond Study Limits

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH UMPQUA RIVER SOUTH UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
South Umpqua River (cont'd)							
W	62,185	722[2]	17,300	7.2	451.1	450.3	0.8
X	63,180	613[2]	16,300	7.6	451.7	451.0	0.7
Y	64,015	402[2]	13,000	9.5	452.2	451.4	0.8
Z	65,840	566	16,400	7.6	454.1	453.3	0.8
AA	68,030	635	17,300	7.2	455.6	455.1	0.5
AB	69,125	576	12,700	9.8	456.2	455.6	0.6
AC	70,945	320	9,140	13.6	458.4	457.9	0.5
AD	73,345	500	14,200	8.7	464.5	464.1	0.4
AE	75,625	836	22,900	5.4	467.3	467.0	0.3
AF	76,845	564	15,700	7.9	467.7	467.4	0.3
AG	78,535	1,000	25,000	5.0	469.2	468.8	0.4
AH	79,770	466	12,800	9.7	469.4	469.0	0.4
AI	81,170	372	10,400	11.9	471.2	470.8	0.4
AJ	83,670	632	16,000	7.8	474.6	474.2	0.4
AK	84,710	783	16,100	7.7	475.8	475.3	0.5
AL	86,030	417[3]	12,700	9.8	477.2	476.7	0.5
AM	87,335	600[3]	15,600	7.9	479.1	478.4	0.7
AN	88,725	1,100	30,100	4.1	481.0	480.2	0.8
AO	90,220	1,443	28,800	4.3	481.8	480.9	0.9
AP	91,195	806	19,500	6.4	482.4	481.5	0.9
AQ	91,895	675	16,600	7.4	483.0	482.1	0.9
AR	92,935	1,728	26,300	4.7	484.3	483.4	0.9
AS	94,050	1,550	21,200	5.8	485.0	484.2	0.8
AT	94,615	550	14,200	8.8	485.2	484.4	0.8
AU	95,845	891	15,700	7.9	486.3	485.5	0.8

[1]Feet Above Mouth [2]This Width Extends Beyond Study Limits [3]This Width Does Not Include Islands

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
South Umpqua River (cont'd)							
AV	97,750	1,113	18,600	6.7	487.9	487.0	0.9
AW	99,160	677	15,200	8.1	488.6	487.7	0.9
AX	100,770	1,319	18,900	6.6	489.6	488.7	0.9
AY	101,715	1,727	19,900	6.2	490.1	489.2	0.9
AZ	102,685	1,763	24,800	5.0	491.1	490.1	1.0
BA	104,490	1,237	19,600	6.3	491.6	490.6	1.0
BB	106,445	2,019	22,400	5.5	493.2	492.2	1.0
BC	108,800	2,089	20,300	6.1	496.5	495.5	1.0
BD	109,310	2,194	24,800	5.0	497.4	496.4	1.0
BE	110,700	2,394	27,629	4.5	500.5	499.9	0.6
BF	111,935	2,914[2]	32,408	3.8	501.1	500.4	0.7
BG	113,115	2,867[2]	27,107	4.6	501.6	501.0	0.6
BH	114,180	2,695[2]	27,592	4.5	502.6	502.0	0.6
BI	115,860	2,116[2]	25,258	4.9	504.1	503.4	0.7
BJ	118,220	1,066	15,687	7.9	506.1	505.3	0.8
BK	120,130	1,517	20,433	6.1	509.0	508.0	1.0
BL	121,355	1,190	24,338	5.1	510.2	509.3	0.9
BM	123,340	1,106	20,127	6.2	511.8	510.8	1.0
BN	124,325	1,213	17,592	7.0	512.3	511.4	0.9
BO	125,460	2,034[2]	26,075	4.8	513.6	512.8	0.8
BP	126,380	1,600[2]	22,243	5.6	514.6	513.7	0.9
BQ	127,140	1,523	21,591	5.7	515.8	514.8	1.0
BR	128,960	2,713[2]	40,420	3.1	517.9	517.3	0.6
BS	129,825	2,847[2]	40,148	3.1	518.4	517.8	0.6
BT	130,745	2,720	36,800	3.4	519.0	518.4	0.6

[1]Feet Above Mouth [2]This Width Extends Beyond Study Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
South Umpqua River (cont'd)							
BU	131,980	2,302	27,400	3.9	520.2	519.2	1.0
BV	135,385	2,312	22,100	4.8	522.4	521.4	1.0
BW	136,350	2,416	19,600	5.4	523.0	522.0	1.0
BX	138,315	2,032	19,000	5.6	524.8	523.9	0.9
BY	140,165	500	10,700	9.9	526.6	525.6	1.0
BZ	142,495	390	11,000	9.6	532.6	531.6	1.0
CA	145,475	335	9,460	11.2	535.5	534.7	0.8
CB	149,485	400	11,100	9.6	541.6	540.8	0.8
CC	151,420	640	14,800	7.2	544.0	543.3	0.7
CD	152,475	416	10,700	9.9	545.1	544.6	0.5
CE	154,825	528	13,700	7.7	548.6	547.8	0.8
CF	156,780	1,086	18,400	5.8	551.2	550.3	0.9
CG	157,635	1,950	22,900	4.6	551.9	550.9	1.0
CH	160,170	2,150	24,800	4.3	553.3	552.5	0.8
CI	160,970	1,930	22,700	4.7	553.7	552.9	0.8
CJ	162,645	986	22,000	4.8	554.9	554.2	0.7
CK	163,285	413	11,200	9.5	555.1	554.4	0.7
CL	165,740	452	11,800	9.0	558.7	558.0	0.7
CM	166,440	638	14,500	7.3	560.2	559.2	1.0
CN	167,375	467	12,400	8.5	560.9	560.0	0.9
CO	168,835	1,065	22,700	4.7	562.5	561.5	1.0
CP	170,025	940	18,800	5.6	563.0	562.0	1.0
CQ	171,715	763	17,200	6.2	564.1	563.1	1.0
CR	173,300	1,308	12,700	8.3	565.3	564.3	1.0
CS	174,740	549	13,000	8.2	567.2	566.2	1.0

[1]Feet Above Mouth

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH UMPQUA RIVER-

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
South Umpqua River (cont'd)							
CT	176,125	850	18,800	5.6	568.5	567.5	1.0
CU	177,705	521	13,300	8.0	569.7	568.7	1.0
CV	178,225	375	9,730	10.9	570.6	569.8	0.8
CW	180,810	509	12,900	8.2	575.1	574.4	0.7
CX	182,140	462	12,100	8.7	576.4	575.7	0.7
CY	182,740	642	13,800	7.7	577.6	576.7	0.9
CZ	184,295	317	10,500	10.1	579.2	578.6	0.6
DA	185,520	473	13,400	7.9	581.2	580.4	0.8
DB	191,710	328	10,100	10.5	589.9	589.3	0.6
DC	192,940	565	12,300	8.6	592.2	591.5	0.7
DD	194,320	335	8,460	12.5	594.2	593.5	0.7
DE	196,550	407	12,100	8.8	598.8	597.9	0.9
DF	197,825	600	16,800	6.3	600.8	599.9	0.9
DG	199,005	500[2]	14,400	7.4	601.5	600.6	0.9
DH	199,885	340[2]	11,300	9.4	601.9	601.1	0.8
DI	202,340	451[2]	11,600	9.1	605.9	605.3	0.6
DJ	205,920	415[2]	12,300	8.4	613.5	613.1	0.4
DK	208,325	1,828	30,500	3.4	615.9	615.5	0.4
DL	209,895	1,061	14,700	7.0	616.3	615.9	0.4
DM	212,340	700	13,900	7.4	618.5	617.9	0.6
DN	213,645	1,937	21,800	4.7	620.1	619.4	0.7
DO	216,270	1,868	19,200	5.4	622.0	621.1	0.9
DP	217,565	1,103	15,000	6.9	623.0	622.1	0.9
DQ	218,580	1,438	16,400	6.3	623.9	623.0	0.9
DR	220,115	719	14,600	7.1	625.4	624.5	0.9

[1]Feet Above Mouth [2]This Width Extends Beyond Study Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
South Umpqua River (cont'd)							
DS	222,145	1,150	14,800	7.0	627.2	626.2	1.0
DT	225,140	1,300	14,800	7.0	630.5	629.9	0.6
DU	226,915	1,276	14,400	7.2	632.5	631.9	0.6
DV	229,105	1,507	14,600	7.0	635.2	634.8	0.4
DW	229,980	979	13,000	7.9	636.0	635.6	0.4
DX	230,865	636	12,500	8.3	637.2	636.8	0.4
DY	233,810	457	11,600	8.9	640.0	639.6	0.4
DZ	235,975	790	15,400	6.7	643.9	643.4	0.5
EA	237,685	384	8,730	11.8	646.3	645.6	0.7
EB	239,940	1,032	14,100	7.3	651.0	650.4	0.6
EC	240,805	1,256	18,300	5.6	652.4	651.5	0.9
ED	241,915	1,012	16,600	6.2	653.5	652.7	0.8
EE	243,225	753	16,700	6.2	654.6	653.7	0.9
EF	245,775	994	19,800	5.2	657.0	656.1	0.9
EG	247,670	926	17,300	4.6	659.5	658.9	0.6
EH	248,670	764	10,000	8.0	660.0	659.6	0.4
EI	250,175	917	15,900	5.0	664.8	664.0	0.8
EJ	251,735	572	9,570	8.4	666.0	665.4	0.6
EK	252,675	780	14,500	5.5	667.6	667.2	0.4
EL	253,930	713	11,800	6.8	668.7	668.3	0.4
EM	257,240	536	8,500	9.4	678.2	677.3	0.9
EN	258,535	700	12,200	6.6	682.1	681.1	1.0
EO	259,765	586	10,600	7.6	684.4	683.6	0.8
EP	261,780	826	12,400	6.5	687.8	687.3	0.5
EQ	263,010	574	9,870	8.1	689.3	688.8	0.5

[1]Feet Above Mouth

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
South Umpqua River (cont'd)							
ER	263,960	1,015	12,700	6.3	691.2	690.7	0.5
ES	265,550	1,119	12,300	6.5	694.3	693.4	0.9
ET	266,350	919	11,500	7.0	695.5	694.7	0.8
EU	267,570	670	8,650	9.1	698.0	697.1	0.9
EV	270,000	1,070	12,900	6.1	703.5	702.6	0.9
EW	272,505	1,100	13,300	5.9	707.1	706.8	0.3
EX	277,255	950	9,420	8.4	714.6	713.7	0.9
EY	278,350	1,350	16,200	4.8	717.4	716.8	0.6
EZ	280,970	1,000	10,600	7.4	720.4	719.8	0.6
FA	283,690	930	11,000	7.1	726.6	726.2	0.4
FB	284,605	556	7,050	11.2	728.2	727.8	0.4
FC	285,545	1,477	13,800	5.7	732.9	732.0	0.9

[1]Feet Above Mouth

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

SOUTH UMPQUA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Deer Creek							
A	7,070	170[2]	1,680	6.6	462.9	461.9	1.0
B	8,075	157[2]	1,470	7.6	464.2	463.4	0.8
C	8,600	200[2]	1,380	8.1	470.1	469.1	1.0
D	10,110	500[2]	2,790	4.0	474.4	473.8	0.6
E	11,180	160	1,350	8.2	477.7	477.1	0.6
F	12,295	280	2,600	4.3	481.3	480.5	0.8
G	14,045	105	1,090	10.2	486.2	485.4	0.8
H	15,390	320	2,250	4.2	490.3	489.3	1.0
I	15,950	150	1,320	7.2	490.8	490.1	0.7
J	17,980	107	1,210	7.8	495.1	494.5	0.6
K	19,625	77	849	11.2	504.4	504.4	0.0
L	20,215	205	1,190	8.0	507.4	507.1	0.3
M	20,830	260	854	11.2	510.7	510.6	0.1
N	22,045	204	1,230	7.8	515.9	515.0	0.9
O	24,545	93	717	13.3	522.0	521.7	0.3
P	25,455	210	1,410	6.7	526.9	525.9	1.0
Q	27,820	222	1,570	6.0	531.5	530.9	0.6
R	30,120	205	1,800	5.3	534.4	533.8	0.6
S	30,905	119	1,130	8.4	535.2	534.8	0.4
T	33,980	100	1,020	9.4	551.9	551.4	0.5
U	35,315	133	723	13.2	562.6	562.6	0.0
V	36,365	252	1,950	4.9	569.0	568.7	0.3
W	37,275	108	747	8.3	570.5	569.9	0.6
X	40,360	108	660	9.4	583.7	583.2	0.5
Y	42,900	203	1,380	4.5	595.3	594.6	0.7
Z	44,705	99	682	9.1	603.8	603.8	0.0

[1]Feet Above Mouth [2]This Width Extends Beyond Study Limits

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

DEER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Deer Creek (cont'd)							
AA	45,820	202	910	6.8	608.6	608.6	0.0
AB	46,740	94	510	12.2	613.2	613.2	0.0
AC	48,075	186	1,100	5.6	620.7	620.7	0.0
AD	50,550	76	456	13.6	634.8	634.8	0.0
South Myrtle Creek							
A	1,155	193	1,870	2.3	609.8	608.8	1.0
B	3,590	72	573	7.6	613.9	613.3	0.6
C	5,510	141	883	4.9	623.0	622.8	0.2
D	6,330	75	423	10.3	627.4	627.4	0.0
E	7,300	156	887	4.9	635.0	635.0	0.0
F	8,210	62	573	7.6	638.4	638.3	0.1
G	10,120	66	593	7.3	647.6	646.9	0.7
North Myrtle Creek							
A	3,255	60[2]	563	8.8	615.8	615.7	0.1
B	4,145	220	1,060	4.7	620.2	619.7	0.5
C	5,670	75	463	10.7	628.5	628.1	0.4
D	8,280	86	723	6.8	643.6	642.9	0.7
E	9,400	110	777	6.4	648.5	647.9	0.6
F	10,770	100	775	6.4	654.3	654.0	0.3
Lower Cow Creek							
A	1,625	342	7,760	6.8	658.6	657.7	0.9
B	2,490	300	6,130	8.6	659.4	658.5	0.9
C	4,110	520	9,370	5.6	661.1	660.4	0.7

[1]Feet Above Mouth [2]This Width Extends Beyond Unincorporated County Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

DEER CREEK-SOUTH MYRTLE CREEK-NORTH MYRTLE CREEK- LOWER COW CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Lower Cow Creek (cont'd)							
D	5,915	353	6,310	8.3	662.3	661.6	0.7
E	7,175	508	6,570	8.0	664.0	663.3	0.7
F	9,520	1,390[2]	13,200	4.0	668.5	667.6	0.9
G	11,575	1,540[2]	12,500	4.2	671.6	670.7	0.9
H	14,380	1,730	10,000	5.2	676.3	675.3	1.0
I	15,360	1,410	9,820	5.3	678.9	677.9	1.0
J	16,280	2,110	14,200	3.7	680.8	679.8	1.0
K	17,485	1,720	11,200	4.7	682.3	681.3	1.0
L	18,485	700	8,120	6.5	683.8	682.8	1.0
M	19,620	1,700	10,500	5.0	686.3	685.7	0.6
N	21,280	1,060	9,760	5.4	688.4	687.8	0.6
O	21,820	1,480	9,740	5.4	689.1	688.8	0.3
P	22,900	1,060	8,010	6.5	690.7	690.1	0.6
Q	24,270	380	6,260	8.4	693.2	692.4	0.8
R	25,255	742	10,200	5.1	695.2	694.4	0.8
S	27,555	2,080	15,900	3.3	700.6	699.9	0.7
T	28,610	1,420	10,500	5.0	703.0	702.4	0.6
U	30,060	350	5,640	9.3	705.2	704.6	0.6
V	32,040	600	7,440	7.0	708.2	707.2	1.0
W	32,915	400	6,380	8.2	709.4	708.8	0.6
X	35,065	351	7,200	7.3	713.9	713.1	0.8

[1]Feet Above Mouth [2]This Width Extends Beyond Study Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

LOWER COW CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Cow Creek							
A	0	334	4,030	5.8	1,365.2	1,364.2	1.0
B	1,955	204	2,300	10.2	1,368.6	1,368.0	0.6
C	4,840	200	2,740	8.6	1,378.6	1,377.6	1.0
D	6,330	950	12,100	1.9	1,380.2	1,379.2	1.0
E	7,300	807	8,360	2.8	1,380.8	1,380.1	0.7
F	7,520	530	6,260	3.8	1,381.8	1,381.2	0.6
G	8,760	625	5,050	4.6	1,382.6	1,382.0	0.6
H	9,705	950	7,510	3.1	1,384.2	1,383.2	1.0
I	11,285	1,030[2]	6,210	3.8	1,386.0	1,385.0	1.0
J	13,460	500[2]	3,930	6.0	1,389.4	1,388.4	1.0
K	14,525	625[2]	4,180	5.6	1,390.8	1,389.8	1.0
L	15,785	520[2]	3,420	6.9	1,392.8	1,391.8	1.0
M	16,720	613	3,530	6.7	1,394.7	1,393.7	1.0
N	17,990	205	1,890	12.4	1,396.1	1,395.1	1.0
O	19,135	730	4,180	4.5	1,399.5	1,398.5	1.0
P	19,370	604	4,020	4.7	1,401.0	1,400.1	0.9
Q	21,195	1,090	6,560	2.9	1,405.0	1,404.0	1.0
R	23,635	1,060	6,600	2.9	1,410.1	1,409.1	1.0
S	25,730	550	2,520	7.5	1,414.4	1,413.4	1.0
T	26,655	674	3,290	5.8	1,417.2	1,416.8	0.4
U	28,340	472	2,900	6.6	1,420.1	1,419.8	0.3
V	30,275	143	1,550	12.3	1,424.4	1,423.6	0.8
W	31,340	553	3,780	5.0	1,427.9	1,426.9	1.0
X	32,880	266	2,110	9.0	1,429.9	1,429.0	0.9
Y	34,060	336	2,680	7.1	1,433.1	1,432.1	1.0
Z	35,345	477	1,840	10.3	1,437.4	1,437.4	0.0

[1]Feet Above Cross Section A [2]This Width Extends Beyond Study Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

COW CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Cow Creek (cont'd)							
AA	36,960	1,350	7,420	2.6	1,443.7	1,443.6	0.1
AB	37,810	760	4,290	4.4	1,444.8	1,444.5	0.3
AC	39,540	230	1,770	10.8	1,448.8	1,448.4	0.4
AD	40,385	560	2,680	7.1	1,451.9	1,451.5	0.4
AE	41,235	266	2,550	7.5	1,454.1	1,453.4	0.7
AF	42,635	405	1,600	11.8	1,457.1	1,456.6	0.5
AG	43,290	765	3,340	5.7	1,460.5	1,460.0	0.5
AH	45,530	269	1,480	12.8	1,464.5	1,464.4	0.1
AI	46,300	521	3,740	5.1	1,469.0	1,468.7	0.3
AJ	47,000	300	2,060	9.2	1,469.8	1,469.6	0.2
AK	48,100	420	2,510	7.6	1,473.8	1,473.6	0.2
AL	49,095	825	3,210	5.9	1,477.1	1,476.3	0.8
AM	51,060	1,160	5,850	3.2	1,485.4	1,484.7	0.7
AN	52,180	450	2,030	9.4	1,487.4	1,486.5	0.9
AO	52,950	693	3,690	5.2	1,490.5	1,490.3	0.2
AP	54,525	303	2,160	8.8	1,493.5	1,492.8	0.7
AQ	56,745	386	2,770	6.9	1,500.6	1,499.7	0.9
AR	58,490	471	2,520	7.5	1,505.6	1,505.1	0.5
AS	59,785	677	2,560	7.4	1,510.4	1,510.4	0.0
AT	61,340	470	1,960	9.7	1,517.2	1,517.1	0.1
AU	62,650	500	3,560	5.3	1,522.3	1,522.1	0.2
AV	63,780	1,050	3,180	6.0	1,524.9	1,524.3	0.6
AW	64,725	198	1,680	11.3	1,527.6	1,527.5	0.1
AX	66,570	680	5,960	3.2	1,536.1	1,535.7	0.4

[1]Feet Above Cross Section A

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

COW CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Cow Creek (cont'd)							
AY	67,750	271	1,580	12.0	1,537.0	1,536.6	0.4
AZ	70,000	140	2,430	7.8	1,547.9	1,546.9	1.0
BA	71,225	222	2,120	9.0	1,554.2	1,553.2	1.0
BB	72,050	172	1,520	9.8	1,556.4	1,555.7	0.7
BC	72,895	224	1,850	8.1	1,559.5	1,559.4	0.1
BD	74,860	300	1,950	7.7	1,564.5	1,564.4	0.1
BE	75,790	143	1,140	13.1	1,568.3	1,567.7	0.6
BF	76,540	252	2,150	7.0	1,573.2	1,572.4	0.8
BG	77,320	503	4,170	3.6	1,574.9	1,573.9	1.0
BH	78,005	153	1,300	11.5	1,575.5	1,574.9	0.6
BI	79,610	530	4,670	3.2	1,581.7	1,581.4	0.3
BJ	80,400	345	1,830	8.2	1,583.1	1,582.9	0.2
BK	82,485	187	1,690	8.9	1,594.5	1,594.5	0.0
BL	83,540	285	3,110	4.8	1,603.0	1,602.2	0.8
BM	85,530	205	1,910	6.3	1,607.6	1,606.6	1.0
BN	85,930	555	3,870	3.1	1,609.2	1,608.4	0.8
BO	87,665	100	776	15.5	1,612.1	1,612.0	0.1
BP	88,865	158	1,560	7.7	1,619.4	1,619.3	0.1
BQ	90,800	85	610	19.7	1,627.4	1,627.0	0.4
BR	92,255	310	1,680	7.1	1,639.5	1,638.6	0.9
BS	93,035	195	1,140	10.5	1,643.2	1,642.3	0.9
BT	94,120	476	2,888	4.2	1,647.8	1,647.4	0.4
BU	94,830	209	1,320	9.1	1,649.2	1,649.0	0.2
BV	95,805	436	2,660	4.5	1,653.5	1,652.9	0.6
BW	97,580	210	1,500	8.0	1,660.5	1,659.5	1.0

[1]Feet Above Cross Section A

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOODWAY DATA

COW CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Cow Creek (cont'd)							
BX	98,875	460	1,860	6.4	1,665.1	1,664.4	0.7
BY	99,645	167	1,230	9.7	1,669.9	1,669.1	0.8
BZ	100,185	270	1,330	9.0	1,678.0	1,678.0	0.0
CA	101,815	167	1,110	10.8	1,687.5	1,687.5	0.0
CB	104,205	113	1,290	7.1	1,700.3	1,699.3	1.0
CC	104,400	253	1,600	5.7	1,701.6	1,700.7	0.9
CD	106,030	112	962	9.5	1,703.7	1,702.8	0.9
CE	107,425	84	832	11.0	1,708.0	1,708.0	0.0
CF	108,305	234	2,000	4.6	1,712.0	1,712.0	0.0
CG	109,275	77	688	13.3	1,714.0	1,713.9	0.1
CH	110,280	167	1,460	6.3	1,718.0	1,717.9	0.1
CI	111,845	82	700	13.1	1,723.1	1,723.0	0.1
CJ	114,040	112	782	11.7	1,733.0	1,733.0	0.0
CK	115,945	80	660	13.9	1,740.9	1,740.9	0.0
CL	117,800	127	1,060	8.6	1,753.3	1,753.1	0.2
CM	119,320	100	1,020	9.0	1,758.7	1,758.1	0.6
CN	119,875	317	1,950	4.7	1,759.7	1,759.3	0.4
CO	121,850	200	1,420	6.4	1,764.4	1,764.2	0.2
CP	123,025	80	691	13.3	1,767.6	1,767.4	0.2
CQ	124,530	150	1,210	7.6	1,777.8	1,777.8	0.0
CR	126,665	109	917	10.0	1,783.8	1,783.5	0.3
CS	127,635	146	1,050	8.7	1,787.6	1,786.6	1.0
CT	128,985	87	845	10.8	1,792.3	1,791.9	0.4
CU	131,075	114	1,070	8.6	1,801.1	1,801.0	0.1
CV	132,105	88	798	11.5	1,806.3	1,806.2	0.1

[1]Feet Above Cross Section A

BEST COPY AVAILABLE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

COW CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	[1] DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Cow Creek (cont'd)							
CW	134,280	152	1,050	8.7	1,821.8	1,821.5	0.3
CX	135,870	97	780	11.7	1,839.1	1,839.0	0.1
CY	137,865	186	1,420	6.5	1,853.4	1,853.4	0.0
CZ	139,035	100	783	11.7	1,858.0	1,858.0	0.0
DA	140,035	127	1,110	8.3	1,865.0	1,865.0	0.0
DB	141,070	83	668	11.2	1,869.8	1,869.7	0.1
DC	142,640	125	1,010	7.4	1,878.9	1,878.9	0.0
DD	143,715	220	810	9.3	1,882.2	1,882.2	0.0
DE	144,580	98	851	8.8	1,885.5	1,885.5	0.0
DF	147,200	170	1,200	6.3	1,895.4	1,895.4	0.0
DG	149,065	100	830	9.0	1,902.3	1,902.1	0.2
DH	150,180	136	1,020	7.4	1,906.0	1,905.8	0.2
DI	153,635	116	800	9.4	1,917.7	1,917.7	0.0
DJ	154,460	140	870	8.6	1,921.6	1,921.6	0.0
DK	155,945	100	805	9.3	1,928.7	1,928.4	0.3

[1] Feet Above Cross Section A

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR

(UNINCORPORATED AREAS)

FLOODWAY DATA

COW CREEK

BEST COPY AVAILABLE

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

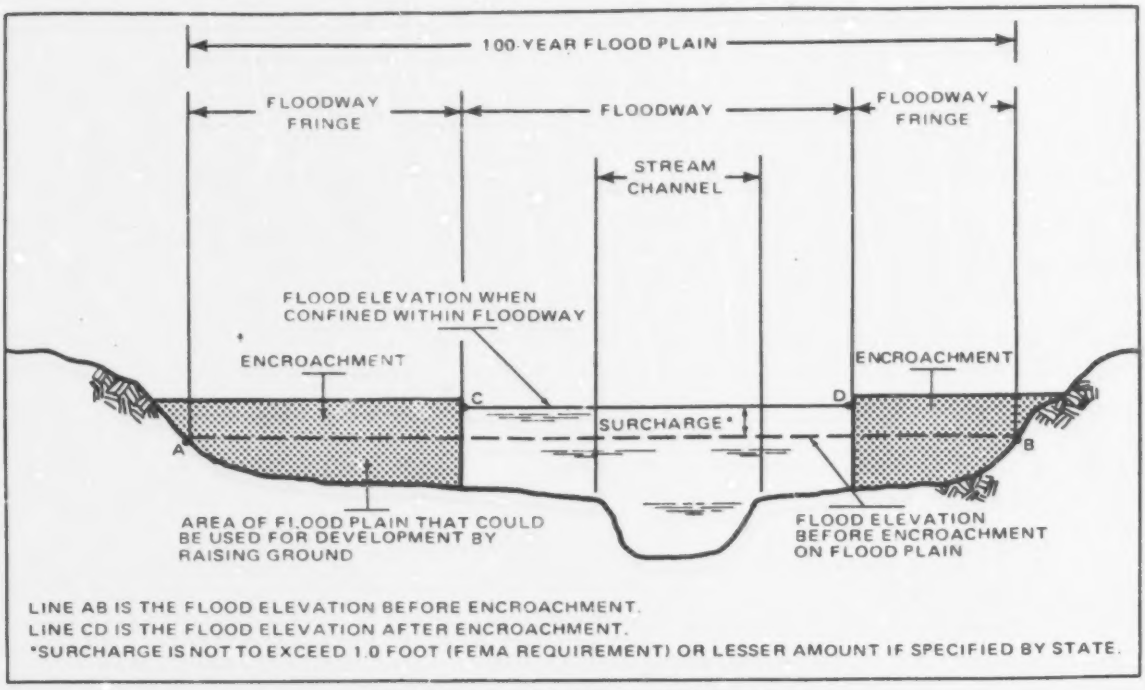
100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT.
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT.
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

Figure 2. Floodway Schematic

On Scholfield Creek, high-water marks of the January 1974 flood show a flat 100-year profile from the mouth to Oar Creek. This reach is entirely in backwater from the Umpqua River, and the stage is affected by tide. It is believed that reverse flow occurs on Umpqua River in this reach because of the tidal fluctuations. For this reason, no attempt was made to compute a floodway for Scholfield Creek below Oar Creek, or for the Umpqua River below approximately the confluence with the Smith River.

BEST COPY AVAILABLE

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail affecting the unincorporated areas of Douglas County.

5.1 Reach Determinations

Reaches are defined as sections of flood plain that have relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of Douglas County are shown on the Flood Profiles (Exhibit 1) and summarized in Table 3.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one-half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

BEST COPY AVAILABLE

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Umpqua River							
Reach 1[4]	0225,0230	-1.0	-0.3	0.5	010	A2	8
Reach 2	0090,0230	-1.6	-0.4	1.0	015	A3	Varies - See Map
Reach 3	0230	-3.2	-0.9	2.2	030	A6	Varies - See Map
Reach 4	0230,0235, 0265	-4.8	-1.7	3.1	050	A10	Varies - See Map
Reach 5	0265,0270, 0290,0380, 0385,0395, 0505,0510, 0520,0710, 0730	-10.9	-2.9	5.9	110	A21	Varies - See Map
Smith River							
Reach 1	0090,0095, 0230,0235	-3.6	-1.2	2.6	035	A7	Varies - See Map
Reach 2	0095,0115	-5.6	-1.9	4.0	055	A11	Varies - See Map
Scholfield Creek							
Reach 1	0230	-2.4	-1.0	1.7	025	A5	11
Reach 2	0230	-1.5	-0.6	0.8	015	A3	Varies - See Map
North Umpqua River							
Reach 1	0730,0735, 0755,0760	-7.8	-2.3	5.3	080	A16	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot [4]Affected by Tidal Flooding from Pacific Ocean

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

UMPQUA RIVER-SMITH RIVER-SCHOLFIELD CREEK-NORTH UMPQUA RIVER

BEST COPY AVAILABLE

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
South Umpqua River							
Reach 1	0730,0740	-2.5	-0.8	1.2	025	A5	Varies - See Map
Reach 2	0740	-4.1	-1.1	1.2	040	A8	Varies - See Map
Reach 3	0740	-5.8	-1.2	2.6	060	A12	Varies - See Map
Reach 4	0740,0930	-4.6	-1.1	1.7	045	A9	Varies - See Map
Reach 5	0925,0930, 0940	-3.1	-0.8	1.2	030	A6	Varies - See Map
Reach 6	0940,1130	-4.9	-1.3	2.4	050	A10	Varies - See Map
Reach 7	1130,1135	-6.0	-1.7	3.1	060	A12	Varies - See Map
Reach 8	1130,1135, 1140,1145	-4.8	-1.3	2.5	050	A10	Varies - See Map
Deer Creek							
Reach 1	0740,0745	-1.3	-0.4	0.8	015	A3	Varies - See Map
South Myrtle Creek							
Reach 1	1135	-4.9	-1.4	2.8	050	A10	Varies - See Map
Reach 2	1135	-1.8	-0.7	1.0	020	A4	Varies - See Map
North Myrtle Creek							
Reach 1	1135	-1.7	-0.6	1.2	015	A3	Varies - See Map
Lower Cow Creek							
Reach 1	1140	-4.4	-1.2	2.3	045	A9	Varies - See Map
Reach 2	1140	-2.2	-0.6	0.8	020	A4	Varies - See Map
Cow Creek							
Reach 1	1320,1340, 1455	-2.2	-0.7	0.9	020	A4	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

DOUGLAS COUNTY, OR
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

SOUTH UMPQUA RIVER-DEER CREEK-SOUTH MYRTLE CREEK-NORTH MYRTLE CREEK -LOWER COW CREEK-COW CREEK

BEST COPY AVAILABLE

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A2-A12, A16, and A21:	Special Flood Hazard Areas inundated by the 100-year flood; with base flood elevations shown, and zones subdivided according to FHFs.
Zone B:	Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- or 500-year floods by dike, levee, or other local water-control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flood hazard; not subdivided.
Zone D:	Areas of undetermined, but possible flood hazard.

The flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are summarized in Table 3.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the unincorporated areas of Douglas County is, for insurance purposes, the principal product of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevations. Base flood elevation lines show the locations of the expected whole-foot water-surface elevation of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the NFIP.

6.0 OTHER STUDIES

In 1966, the COE released a Flood Plain Information report (Reference 6) that covers the Umpqua River in Coles Valley and Garden Valley; Calapooya Creek, from its mouth to Fair Oaks; the North Umpqua River, from its

BEST COPY AVAILABLE

mouth to Winchester; the South Umpqua River, from its mouth to above Days Creek; and Cow Creek, from its mouth to Cornutt Siding. This report shows the approximate areas covered by the floods of December 1955 and December 1964, but does not show any profiles. This study supersedes the COE report because of the more detailed nature of the analysis.

The base flood discharge used for the South Umpqua River profile was within 2 percent of that used by the COE in its Umpqua River review report of 1971 (Reference 4); for the Umpqua River, the base flood discharge was within 6 percent of the COE figure. These discharges were different because of different methods of analysis and data base. Values in this Flood Insurance Study are valid.

In 1972, 1973, and 1975 the USGS released flood profile studies (References 1, 2, and 3, respectively) that provide the basic cross section and profile data used for the reaches studied in detail for this report.

This Flood Insurance Study is in general agreement with the Flood Insurance Studies published for the Cities of Winston (Reference 14), Roseburg (Reference 16), and Myrtle Creek (Reference 17). This study is also in agreement with the Flood Insurance Study prepared for the City of Reedsport (Reference 18).

In 1968, the USGS did a flood profile study of Elk Creek and Yoncalla Creek in northern Douglas County (Reference 11), which was used to estimate an approximate boundary of the 100-year flood for this study.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, Federal Regional Center, 130 228th Street, SW., Bothell, Washington 98011.

8.0 BIBLIOGRAPHY AND REFERENCES

1. U.S. Department of the Interior, Geological Survey, Open-File Report, Flood Profiles in the Umpqua River Basin, Oregon, Part 1, 1972

2. U.S. Department of the Interior, Geological Survey, Open-File Report, Flood Profiles in the Umpqua River Basin, Oregon, Part 2, 1973

3. U.S. Department of the Interior, Geological Survey, Open-File Report, Flood Profiles in the Umpqua River Basin, Oregon, Part 3, 1975

4. U.S. Department of the Army, Corps of Engineers, Interim Report, South Umpqua River, Review Report on Umpqua River and Tributaries, Oregon, 1971

BEST COPY AVAILABLE

5. U.S. Department of Commerce, Bureau of the Census, PC80-1-A39, Number of Inhabitants, Oregon, 1980

6. U.S. Department of the Army, Corps of Engineers, Portland District, Flood Plain Information, Douglas County, Oregon, 1966

7. U.S. Department of the Army, Corps of Engineers, Portland District, Procedures for Determination of Maximum Annual Flood Peak and Volume Frequencies, 1969

8. U.S. Water Resources Council, Bulletin 15, "A Uniform Technique for Determining Flood Flow Frequencies," December 1967

9. U.S. Department of the Interior, Geological Survey, B292 Step-Backwater Computer Program, 1964

10. Douglas County Planning Commission, Orthophoto-Contour Maps of Selected Reaches of Umpqua River and Tributaries, Scale 1:4,800, Contour Interval 5 feet, Photogrammetry by Spencer B. Gross and David C. Smith, Portland, Oregon, 1972, 1973, 1974

11. U.S. Department of the Interior, Geological Survey, Channel Capacity and Flood Characteristics for Selected Reaches of Elk Creek and Tributaries, Douglas County, Oregon, E.A. Oster and C.H. Swift, III, 1969

12. U.S. Department of the Interior, Geological Survey, 15-Minute Series Topographic Maps, Scale 1:62,500, Contour Interval 80 feet: Anlauf, Oregon (1954); Camas Valley, Oregon (1955); Drain, Oregon (1954); Glide, Oregon (1954); Reedsport, Oregon (1956); Roseburg, Oregon (1955); Sutherlin, Oregon (1954)

13. CH2M HILL, Aerial Photography, Winchester Bay Area, Scale 1:12,000, flown December 16, 1981

14. U.S. Department of the Army, Corps of Engineers, Topographic Map, Scale 1:24,000, Contour Interval 5 feet: Days Creek Reservoir, Oregon (1965)

15. Federal Emergency Management Agency, Flood Insurance Study, City of Winston, Oregon, 1981

16. Federal Emergency Management Agency, Flood Insurance Study, City of Roseburg, Oregon, 1982

17. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Myrtle Creek, Oregon, 1978

18. Federal Emergency Management Agency, Flood Insurance Study, City of Reedsport, Oregon, 1984

U.S. Water Resources Council, Bulletin 17, "Guidelines for Determining Flood Flow Frequencies," March 1976

BEST COPY AVAILABLE